

### REMARKS

Claims 1-47 are currently pending in the subject application and are presently under consideration. Claim 38 has been amended as shown on page 7 of the Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

#### **I. Rejection of Claims 1-47 Under 35 U.S.C. §101**

Claims 1-47 stand rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. This rejection should be withdrawn for at least the following reasons. Claims 1-47 produce a useful, concrete and tangible result, and further, the subject claims pertain to a *system that facilitates optimizing industrial business operations*, including a ***prognostics engine*** that infers at least one future state of the operations based in part on the received data.

Because the claimed process applies the Boolean principle [abstract idea] ***to produce a useful, concrete, tangible result*** ... on its face the claimed process comfortably falls within the scope of §101. *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358. (Fed. Cir. 1999) (Emphasis added); *See State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1373, 47 USPQ2d 1596, 1601 (Fed.Cir.1998). The inquiry into patentability requires an examination of the contested claims to see if the claimed subject matter, as a whole, is a disembodied mathematical concept representing nothing more than a "law of nature" or an "abstract idea," or if the mathematical concept has been ***reduced to some practical application rendering it "useful."*** *AT&T* at 1357 citing *In re Alappat*, 33 F.3d 1526, 31 USPQ2d 1544, 31 U.S.P.Q.2D (BNA) 1545, 1557 (Fed. Cir. 1994) (emphasis added).

The Examiner contends that the claimed subject matter does not produce tangible results and fails to produce a result that is limited to real world value rather than a result that may be interpreted to be abstract in nature. Applicants' representative disagrees and submits that the Final Office Action misconstrues the requirements necessary to fulfill the conditions for patentability under 35 U.S.C. §101. According to *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), the standard set forth by the Federal Circuit for determining whether claims are directed towards statutory subject

matter is whether the claims as a whole can be applied in a practical application to ***produce a useful, concrete and tangible result***. It is the result of the claims as applied in a practical application that is germane to the determination of whether the claims are directed towards statutory subject matter, not whether the underlying means by which the result is effectuated that should be tangible, as intimated in the Final Office Action. It is believed therefore that the subject claims clearly satisfy this legal standard. In particular, independent claim 1 recites: *A system that facilitates optimizing industrial business operations, comprising, a component that receives data relating to at least one state of a subset of machines that are part of the industrial business operations; and a prognostics engine infers at least one future state of at least a subset of the operations based in part on the received data, the prognostics engine comprising a plurality of intelligent software agents that serve as proxies for at least the subset of machines, for modeling and representing interactions with one another, and for facilitating convergence on modification and control of the subset of machines, for efficiently optimizing industrial business operations.* Thus, claims 1-47 elicit a series of independent acts that culminate in a useful, concrete and tangible result.

## **II. Rejection of Claim 38 Under 35 U.S.C. §102(e)**

Claim 38 stand rejected under 35 U.S.C. §102(e) as being anticipated by Bryant *et al.* (US Publication 2004/0236450 A1). This rejection should be withdrawn for at least the following reasons. Bryant *et al.* does not disclose or suggest every limitation set forth in the subject claims.

A single prior art reference anticipates a patent claim only if it ***expressly or inherently describes each and every limitation set forth in the patent claim***. Trintec Industries, Inc. v. Top-U.S.A. Corp., 295 F.3d 1292, 63 USPQ2d 1597 (Fed. Cir. 2002); See Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The ***identical invention must be shown in as complete detail as is contained in the ... claim***. Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added).

Claim 38 recites *a data packet adapted to be transmitted between at least two computer processes, comprising a data field comprising information that regulates operation of a business component based at least upon prognostic data derived by a classifier performing a probabilistic analysis for future state of at least a subset of the operations concerning a machine.* Bryant *et al.* does not disclose or suggest these novel features.

Bryant *et al.* relates to a method of diagnosing state of a system in which a measured signal is compared to an expected signal, and the comparison is used to perform the diagnosis. The Final Office Action cites the Abstract and paragraphs [0114]-[0122] and [0125]-[0132] of Bryant *et al.* Contrary to assertions in the Final Office Action, Bryant *et al.* does not disclose or suggest at these paragraphs, let alone anywhere in the document, the claimed subject matter as indicated above. Rather, these cited sections merely disclose a method for assembling a model having correspondences with a physical system. The system is monitored so that the model parameters may be tuned to mimic the real system, whereupon the model can be manipulated to study behavior of the system. A system diagnosis is obtained by measuring “noise” in the machine, *i.e.* the difference between the actual signal as measured from the machine, and the expected signal. In the Abstract *inter alia*, Bryant *et al.* states that the model may have parameters, associated with features and/or faults of the system, that are used in diagnosing the state of the system, and that “*selectively repeated diagnosis over time may yield a prognosis of the system.*” Paragraph [0122] adds that “a prognosis may predict the failure of a part.” It is clear that Bryant *et al.* can only be used to model the current state of a part in a system and observe a trend, which is very different from the claimed invention in which probabilistic and statistical techniques are used to infer a prognosis of the *future* state of an *entire* machine. It is therefore readily apparent that Bryant *et al.* fails to disclose or suggest anything concerning *regulating operation of a business component based at least upon prognostic data derived by a classifier performing a probabilistic analysis for future state of at least a subset of the operations concerning a machine.* Therefore, Bryant *et al.* fails to disclose “every aspect of the claimed invention” and for at least these reasons, the rejection of claim 38 should be withdrawn.

### **III. Rejection of Claims 1-37 and 39-47 Under 35 U.S.C. §103(a)**

Claims 1-37 and 39-47 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gotou *et al.* (US 2002/0013635 A1) in view of Bryant *et al.* (US 2004/0236450 A1). This rejection should be withdrawn for at least the following reasons. Gotou *et al.* and Bryant *et al.*, taken alone or in combination, do not disclose or suggest every limitation set forth in the subject claims.

To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, ***the prior art reference (or references when combined) must teach or suggest all the claim limitations.*** See MPEP §706.02(j) (emphasis added)

Applicant's invention of claim 1 relates to a *system that facilitates optimizing industrial business operations*, including a ***prognostics engine that infers at least one future state of the operations based in part on the received data*** and includes: ***a plurality of intelligent software agents that serve as proxies for at least the subset of machines, for modeling and representing interactions with one another, and for facilitating convergence on modification and control of the subset of machines, for efficiently optimizing industrial business operations.*** Independent claims 10, 33, 44 and 47 recite similar limitations. Gotou *et al.* and Bryant *et al.*, taken alone or in combination, do not disclose or suggest these novel features of applicant's claimed invention.

Gotou *et al.* relates to a system for monitoring the status of abnormality and lifetime of machine components such as a bearing having rolling elements. The system includes a plurality of determining units each connected with a plurality of sensors and a control means connected with the determining units. The Examiner concedes that Gotou *et al.* does not teach all limitations recited in the subject independent claims, and attempts to cure the deficiencies of Gotou *et al.* with Bryant *et al.* However, Bryant *et al.* merely relates to a method of diagnosing state of a system in which a measured signal is

compared to an expected signal, the comparison is used to perform the diagnosis and the repeated diagnosis over the time yield a prognosis of the system; and this reference does not make up for the aforementioned deficiencies of Gotou *et al.*

At page 4 of the Final Office Action, the Examiner asserts that Gotou *et al.* substantially teaches *the prognostics engine comprising a plurality of intelligent software agents that serve as proxies for at least the subset of machines, for modeling and representing interactions with one another, and for facilitating convergence on modification and control of the subset of machines, for efficiently optimizing industrial business operations.* Applicant's representative respectfully disagrees. At the indicated portions, Gotou *et al.* provides a sensor to detect influence signal that carry information about strains, change in load, vibration etc. Each of the determining units determines the presence or absence of an abnormality and the status of lifetime based on influence signal that has resulted from passage of the rolling elements, and contains a defect signal component, if there is any defect in any machine component (Page 2, paragraph 13). A diagnostic component diagnoses a state of the lifetime of the machine component in reference to the sensor information. Lifetime resulting from an abnormality such as material collision is also considered. The diagnosis result information brought as a result of diagnoses by the diagnosing component is transmitted to the client corporation and so the machine component can be diagnosed at the business establishment of the manufacturing and selling corporation at a remote location (Page 5, Paragraph 51 and 52). Hence Gotou *et al.* provides for only *determining and diagnosing any abnormality associated with any machine component* and nowhere teaches or suggests *a plurality of intelligent software agents that serve as proxies for at least the subset of machines, for modeling and representing interactions with one another, and for facilitating convergence on modification and control of the subset of machines, for efficiently optimizing industrial business operations.* The intelligent agents are software models representative of their various physical or software counterparts, and these agents serve as proxies for their counterparts and facilitate execution of various aspects. Hence rather than executing an optimization algorithm for example on a respective device directly, such algorithms can be first executed on the respective agents and then once the system

decides on an appropriate set of modifications the final modifications are implemented at the agent counterparts with the agents carrying the instructions for such modifications.

At page 5 of the of the Final Office Action, the Examiner again erroneously asserts that Gotou *et al.* substantially teaches *the prognostic engine comprises a classifier and the classifier performs a probabilistic analysis in connection with the inference*, with respect to dependent claim 3 and 7. The cited portion of the reference, Gotou *et al.*, provides for a database in which specifications for each type of the machine components and examples of diagnosis are registered and the diagnostic component utilizes the database for diagnosis. The accuracy of the diagnosis and increase of reliability is facilitated through the database in comparison to theoretical judgment (Page 6, column 60-61). If any particular machine component require repair only and not replacement information on the result of diagnosis that repair is sufficient is given by the diagnostic component to the merchandise information adding means and the merchandise information adding means then add repair information registered in the database, as the merchandise information (Page 20, Column 239). Hence Gotou *et al.* provides for only a *database that contains specifications of each machine component and examples of diagnosis and the database helps in diagnosing a machine component accurately* and fails to teach or suggest *the prognostic engine comprises a classifier and the classifier performs a probabilistic analysis in connection with the inference*. The secondary reference also, Bryant *et al.*, only performs *repeated diagnosis to yield a prognosis* of the system (abstract and paragraph [0003]) and nowhere suggests or teaches that the *prognosis engine comprises a classifier and the classifier performs a probabilistic analysis in connection with the inference*.

Therefore, Gotou *et al.* and Bryant *et al.*, taken alone or in combination, fail to disclose or suggest every aspect of the claimed invention. For at least these reasons, the rejection of independent claims 1, 10, 33, 39, 40, 44 and 47 (and claims that depend there from) should be withdrawn.

**CONCLUSION**

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [ALBRP246USC].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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